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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/594,481

06/22/2007

Jiro Okai

20162.13USWO

9500

52835

7590

12/01/2009

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EXAMINER

LOEWE, ROBERT S

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

12/01/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/594,481 | <b>Applicant(s)</b><br>OKAI ET AL. |  |
|                              | <b>Examiner</b><br>ROBERT LOEWE      | <b>Art Unit</b><br>1796            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☒ Claim(s) 8-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                            |                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/28/06; 12/18/06</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Specification***

Table 1 of the instant specification is objected to because of an alleged error. Table 1 recites the heading "Comparative Example". However, Table 1 is believed to contain the compositions according to the instant invention and should be amended to --Example--.

### ***Claim Objections***

Instant claims 8-14 should be amended so as to depend from either instant claim 4 or instant claim 6.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-17, 19, 20, 22 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Komitsu et al. (US Pat. 6,642,309).

Claim 1: Example 1 of Table 2 of Komitsu et al. teaches a blend of a silane-capped polyoxypropylene and a vinyl polymer. The vinyl polymer is a mix of 82% butyl acrylate, 2.3% methyl methacrylate and 15.7% stearyl methacrylate/octadecyl methacrylate (Table 1, example of synthesis 4). The silyl-functionalized polymer prepared in synthesis 4 is prepared using Technique 1 of Komitsu et al., in which the acrylate-based monomers are copolymerized with a

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compound containing a polymerizable unsaturated bond and a reactive silyl group (8:15-19). In the same paragraph, Komitsu et al. teaches that technique 3 may be employed, which is a process where the acrylate copolymers are prepared in the presence of a chain transfer agent which bears a reactive silyl group (8:27-31). Komitsu et al. further teaches that technique 5 may be employed, which is a process where the acrylate polymer, which is prepared by a living radical polymerization method, is reacted with a reactive silyl group compound into the molecular terminus of the copolymer (8:34-38). Therefore, employment of either of techniques 3 or 5 as applied to synthesis examples 3-5 of Komitsu et al. would yield a vinyl polymer having crosslinkable silyl groups at the polymer terminus.

Claim 2: The polyether polymer is taught to preferably have a molecular weight of not less than 10,000 (5:54-59) and exemplifies a polyoxypropylene having a molecular weight of 19,000.

Claims 5-14: Several of the acrylic polymers exemplified (synthesis 3-5, Table 1), employ a monomer mix which consists of butyl acrylate, methyl methacrylate and stearyl methacrylate in the amounts required by the instant claims. The presence of the methacrylsilane compounds of synthesis 3-5 reflects the method for preparing the silyl-functional polymers of Komitsu (i.e., Technique 1). Again, employment of either of techniques 3 or 5 does not require the addition of a silane-based acrylate co-monomer, since the silyl functionality is introduced post-polymerization.

Claims 15-17: Komitsu et al. teaches that the molecular weight of the acrylic copolymer ranges from 500 to 100,000 (7:55-59), which is believed to anticipate the minimum molecular weight requirements of instant claims 15-17.

Claims 19 and 20: Komitsu et al. exemplifies the use of silyl-capped oxypropylene polymers, thereby satisfying claims 19 and 20.

Claim 22: Komitsu et al. teaches that the vinyl polymer (II) has crosslinkable silyl groups at the polymer terminus (synthesis examples 3-5 coupled with techniques 3 and 5).

Claim 25: Komitsu et al. teaches formed bodies prepared from the composition of instant claim 1 (15:18-39).

Claims 1-3, 5 and 15-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujita et al. (US 2003/0176576, cited as an 'X' reference on the international search report) as optionally evidenced by Bandou et al. (US 2005/0261412).

Claims 1, 2, 19 and 20: Fujita et al. teaches a curable composition comprising a polyether polymer having at least one crosslinkable functional group and a vinyl polymer having at least one crosslinkable functional group at the polymer terminus (abstract). The polyether polymer having at least one crosslinkable group is taught to have a molecular weight of 7,500 to 25,000, which overlaps with the claimed molecular weights of instant claims 1 and 2, so as to warrant a case of anticipation (paragraph 0061). Further, Fujita et al. exemplifies a silyl-capped polyoxypropylene (S303 from Kaneka), which is shown by Bandou et al. as having a molecular weight of 20,000 (paragraph 0229 of Bandou et al.).

Claims 3 and 5: Fujita et al. exemplifies acrylate-based polymers (Table 1).

Claims 15-17: Fujita et al. teaches that the molecular weight of the vinyl polymers are preferably from 10,000 to 50,000 (paragraph 0072), which substantially overlaps the molecular weight ranges of claims 15-17 so as to warrant a case of anticipation.

Claim 18: Fujita et al. teaches that the polydispersity index of the vinyl polymers should be preferably below 1.3 (paragraph 0071).

Claim 21: Fujita et al. teaches that the vinyl polymers may be prepared via atom transfer radical polymerization (paragraphs 0095-0146).

Claim 22: Fujita et al. teaches that the vinyl polymers bear silyl crosslinkable groups (paragraph 0156-0162).

Claim 23: Fujita et al. teaches that the vinyl polymers bear alkenyl groups as functional groups (paragraphs 0163-0180).

Claim 24: Fujita et al. teaches that the vinyl polymers bearing alkenyl groups at the molecular terminals may be crosslinked in the presence of organohydrogenpolysiloxanes or organohydrogensilanes (paragraphs 0211-0214).

Claim 25: The taught end uses of the curable compositions of Fujita et al. (paragraph 0433) anticipate the formation of formed bodies as required by instant claim 25.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18 and 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komitsu et al. (US Pat. 6,642,309) as applied to claim 1 above, and further in view of Kusakabe et al. (US Pat. 5,986,014).

Komitsu et al. teaches curable compositions which satisfy instant claim 1, as described above. While Komitsu et al. does not explicitly teach that the crosslinkable silyl-group-containing acrylate polymers are prepared via atom transfer radical polymerization (ATRP), such a process is rendered obvious in view of Kusakabe et al. Specifically, Komitsu et al. recites JP-09272714 as a process which is suitable to prepare the acrylate-based copolymers using technique 5, as described therein (9:48-50). US Pat. 5,986,014, to Kusakabe et al. is the US equivalent of JP-09272714. Specifically, Kusakabe et al. explicitly teaches preparation of (meth)acrylic polymers prepared via ATRP (2:19-30), therefore, a person having ordinary skill in the art would have found such a process obvious for preparing the vinyl polymers of Komitsu et al. Further, the use of ATRP leads to polymers having very low polydispersities (usually less than 1.5); low polydispersities is well-known to improve the handling and workability of the curable compositions such as those taught by Komitsu et al. and Kusakabe et al. Therefore, employment of ATRP as the radical polymerization method for technique 5 is believed to inherently satisfy the polydispersity requirements of instant claim 18.

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***Relevant Art Cited***

Additional prior art documents which are relevant to Applicants invention can be found on the attached PTO-892 form.

***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Loewe whose telephone number is (571) 270-3298. The examiner can normally be reached on Monday through Friday from 5:30 AM to 3:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. L./

Examiner, Art Unit 1796

13-Nov-09

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/Randy Gulakowski/

Supervisory Patent Examiner, Art Unit 1796